Dan Drifter Construction Manual
(Dan Palance and Jim Manning, Nov 2012)

Preface

We have been developing a variety of low-cost modifications to the original “CODE surface drifter” designed by Russ Davis in 1982. We keep the basic configuration the same in order to maintain the oceanographic-standard drag but try to use materials available at any hardware store. The idea is that the drifter can be built in any high school shop class, for example. The “Dan Drifter” is just another variation of previous models such as the “Rachel” and the “Eddie” drifter. They all have a cross-sectional area of approximately one square meter and, since the electronic package is getting smaller, we have been able to further reduce the windage with each new design. While we simultaneously developed the “Steve Drifter” with garden-stake spars and nylon-cord stays as another more eco-friendly alternative, we found that to be too labor intensive and not necessarily as strong as the Dan. At the time of this writing, we do not have enough experience with the Dan to estimate any good survival statistics but have had a few reporting after months underway. It is best to contact us prior to using this manual to make sure we have not made further adjustments.

1. Preparing the mast

a. Cut a wooden 2” by 4” mast to 44”

b. Drilling spar holes in the mast

i. If making a lot of drifters, it may save you time to build a jig for this step

ii. Using a 3/8” drill bit drill a spar hole 1” on center from the bottom of the 2by4.

iii. Drill a second 3/8” hole 37” (on center) from the bottom of the 2by4.

iv. Rotate 2by4 90º and drill a second set of 3/8” holes 2” (on center) from the bottom and 38” (on center) from the bottom.

Note: If you plan on using wooden dowels for the spars, the 3/8” holes should be made 5/8”

c. Label the body of the drifter w/ basic information

i. Print out & laminate labels that include:

- Deployment ID
- Transmitter ID
- Phone # to call
- “Science” or “Drift Study”

ii. tape, pin, or stencil these to the 4 sides of the wood mast

Figure 1. *Stenciling information on drifter mast*

Note: The jig helps to place your spar holes more accurately.

Note: If a set of sails are already made, make sure your sails fit before you drill all your holes in the 2by4s.

Note: It is not essential to label the drifter with the “deployment id” since it is often not known ahead of time.

2. Preparing the ballast

a. We try to secure a total 5lbs evenly distributed to the bottom of the 2by4

b. If you have window sash weights, break them with a sledge hammer to make a pair of approximately 2.5-lb pieces. If you live near a dive shop or a bait shop, you can buy a pair of 2-lb weights and then add a 1-lb at the bottom. In either case, you can secure one weight on both sides of the 2by4 using either a hose clamp or heavy-duty tie wrap. See photos below.

Figure 2. Ballasting options for Dan Drifter. Fishing weights secured with plastic zip-tie and hose clamp on left, window sash weights on right. Current designs also make use of a small rubber sheet in between hose clamp and weights to prevent slippage.
Note: We often secure the weights above the bottom spars with a stainless bolt rather than thread ing it through the spars. In either case, we always wrap the other end of the weights to the woods with a tie-wrap, tape, or hose clamp.

3. Preparing the transmitter mount

a. Position the upside-down ski pole so it is offset to one side like the image below
b. Fit a c-collar pipe support at each end of the pole on the mast and secure with stainless or brass screws.
c. secure ski pole to mast (best method not determined at the time of this writing)

Figure 3. C-collar and mounting strategy for ski pole mount.

4. Making the Sails (either vinyl or cloth)

a. Vinyl sails

i. Cut the sail material to 19” (width/sides) x 41” (length/end).
ii. On the dull side of the material make a line 5” from each end.
iii. Fold over the end to meet the line and make a crease mark in the material where the fold should be.
iv. Apply glue (using the width of the glue brush as a guide) along the very edge of the sail and along the line
v. Fold edge over and match the edge to the line (The glue dries fairly quickly so only do one sail pocket at a time).

Figure 4. Vinyl sails mounted on Dan Drifter with fiberglass spars.

vi. After glue sets up insert spars temporarily to test sleeve. (If you followed the enclosed instructions and used the template, these sails should have a perfect fit but it is advisable to test all sails after the glue has dried (3-5 minutes).

vii. Slide sails onto spars and secure with a small hose clamp at the end of each spar

b. Cloth sails

i. Fold ends of sail over spars ~2” to create sleeves for spars.

ii. Using a grommet maker, fasten a grommet to each corner of the sail through the sleeve you have created. Be sure to place the grommet lower on the sleeve so there is enough clearance for the spar to pass through

iii. Using a needle and thread, stich the sleeve between the grommets closed so it is a true sleeve

iv. Slide sails onto sleeve, thread heavy duty string or cord through the grommets closest to the mast of each sail and tie off. This prevents the sails from slipping off.

Figure 5. Cloth sail option with grommets, stitching, and cord securing system displayed. *Note #1: If you feel you may have not have been accurate in drilling the holes in the 2by4, insert spars in 2by4 and take measurements (from top of spar to top of spar) and make each sail separately.*
Note#2: If you are making *a lot of sails, you may want to build a jig to eliminate the measuring step on each sail.*

5. Preparing the Transmitter

a. Protect seams of GPS transmitter. We use either:

- marine caulking (such as 5200 or 4200)
- wraps of electric tape and Scotch Kote

b) we usually do this step for you since we work with bulk sets of transmitters

c) Type a note to put inside the bag describing your project, your contact info and ask finders to mail transmitter back.

d) Mark “top” on the outside of your bags along with the 6-digit transmitter #.

e) IMPORTANT: Put the transmitter in the bag so that the top of the transmitter will face up.

f) Minimize air in the bag.

g) Make a tighter package with a few wraps of black tape without hiding the transmitter#

h) Wrap extra sail material around bagged transmitter for cushioning when tightening hose clamp or securing with zip ties so the bag doesn't get ripped by hose clamp.

Note: While the bag around the transmitter is optional, it serves to protect the note and it also provides some material for the hose clamp or tie wrap to grab onto.

6. Securing the Flotation

a. Slide two flotation buoys through the mast extension

b. Slide a hose clamp above the buoys and tighten it so there is 8”-12” of pole above the clamp (exact distance will slightly each unit)

c. note the image below is the first Dan prototype but we are thinking of using an upside-down ski pole with the tip sawed off in order to last the transmitter to the basket instead

Figure 6. Installed flotation on Dan Drifter.

7. Assembly

a. Make sure ballast is secure (or position it to be held by a bottom spar)
b. Insert 48” spars
c. Secure spars using 5/8” hose clamps.
d. Put on sails.
e. Put a washer and another hose clamp on to hold the sail in place.
f. Make sure you secure transmitter with the top facing up or towards the sky using a hose clamp (or heavy-duty tie wrap) and a few wounds of black tape.

Note: Most recent variation of the Dan is using wooden dowels. This is an alternative to fiberglass rods that are often hard to find. As listed in the shopping list below, you might try 5/8” wooden (we have used poplar but oak might be better) dowels with shelf brackets for additional support.

Shopping List

#	item	size	purpose	Cost each	Cost total
2	Fishermen buoys/toggles*	3”x6”	buoyancy	2	2.50
4	Oak dowels**	4'x5/8”	spars	1.44	5.40
8	Shelf bracket (optional)	6”x8”	extra spar support	1.89	15.12
1	2by4	40”'	mast	1.50	1.50
1	Benton Marine Fabric Glue	4oz-tube	Hem sails		.50
16	grommets	3/8”	Secure sails		.30
1	1/8 nylon cord	8'	Secure sails	0.15	.20
1	8oz Canvas dropcloth	41” by 80”	sails	0.18/sqft	1.00
2	Tube joints (2 hole rigid strap)	1 ½ “x1 ½	Secure brush handle to 2by4	0.58	1.16
2	weights	2.5lb	Ballast		0
1	Bolt,washer,nut	4”x3/8”	Secure ballast to mast		1.50
1	stainless hose clamp	4”-5” diameter	Secure ballast	1.74	1.74

*Since these fishermen “net buoys” are not always available locally, we are considering making our own flotation using 1-gallon plastic milk jugs filled with 2-part marine urethane foam. Another option is to use 4lb Domino sugar plastic container which is more cylindrical shaped.

**We are uncertain what we should use for spars. While we list 4' oak dowels, we know they may not be available at all lumber yards and may have to be ordered on-line.